

N<sup>o</sup> 40.

A  
THIRD CATALOGUE  
OF THE  
COMPARATIVE BRIGHTNESS OF  
THE STARS;  
WITH AN  
INTRODUCTORY ACCOUNT OF AN INDEX  
TO MR. FLAMSTEED'S OBSERVATIONS OF THE FIXED STARS,  
CONTAINED IN THE SECOND VOLUME OF THE  
HISTORIA CŒLESTIS.  
TO WHICH ARE ADDED,  
SEVERAL USEFUL RESULTS DERIVED FROM THAT INDEX.  
BY  
WILLIAM HERSCHEL, LL.D. F.R.S.  
FROM THE  
PHILOSOPHICAL TRANSACTIONS.

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A

### THIRD CATALOGUE, &c.

*Read before the ROYAL SOCIETY, May 18, 1797.*

IN my earliest reviews of the heavens, I was much surprised to find many of the stars of the British catalogue missing. Taking it for granted that this catalogue was faultless, I supposed them to be lost. The deviation of many stars from the magnitude assigned to them in that catalogue, for the same reason, I looked upon as changes in the lustre of the stars. Soon after, however, I perceived that these conclusions had been premature, and wished it were possible to find some method that might serve to direct us from the stars in the British catalogue, to the original observations which have served as a foundation to it. The labour and time required for making a proper index, withheld me continually from undertaking the construction of it: but when I began to put the method of comparative brightness in practice, with a view to form a general catalogue, I found the indispensable necessity of having this index recur so forcibly, that I recommended it to my Sister to undertake the arduous task. At my request, and according

A 2

origin  
of  
C. H's  
Index  
to Hamstead;  
Catalogue

to a plan which I laid down, she began the work about twenty months ago, and has lately finished it.

The index has been made in the following manner. Every observation upon the fixed stars contained in the second volume of the *Historia Cælestis* was examined first, by casting up again all the numbers of the screws, in order to detect any error that might have been committed in reading off the zenith-distance by diagonal lines. The result of the computation being then corrected by the quantity given at the head of the column, and refraction being allowed for, was next compared with the column of the correct zenith-distance as a check.

Every star was now computed by a known preceding or following star; and its place according to the result of the computation laid down in the *Atlas Cælestis*, by means of proportional compasses. This was necessary, in order to ascertain the observed star: for the observations contain but little information on the subject; most of the small stars being without names, letters, or descriptions. The many errors in the names of the constellations affixed to the stars, and in the letters by which they are denoted, also demanded a more scrupulous attention; so that only their relative situation, examined by calculation, could ascertain what the stars really were which had been observed.

Every observed star being now ascertained, its number in the British catalogue was added in the margin at the end of the line of the observation; and a book with all the constellations and number of the stars of the same catalogue, with large blank spaces to each of them, being provided, an entry of the page where FLAMSTEED's observation is to be found, was made in its proper place.



If the star observed was not in the British catalogue, it was marked as such in the margin of the observations; and being provided with another book of constellations and numbers, it was entered into the blank space belonging to some known preceding or following star, by which its place had been settled. The Greek and English letters used by FLAMSTEED, whether they were such as had been introduced before, or which he thought it expedient to add to them at the time of observation, were also entered into their proper places; and to complete the whole, the magnitude affixed to the stars was likewise joined to the entry made in the blank spaces of the index.

I have been so far particular in giving the method by which the index has been constructed, that it may appear what confidence ought to be given to the conclusions which will be drawn from its report.

About three or four examples of its use, will completely shew how the results, which will be mentioned, have been obtained.

Suppose I wish to be informed of the particulars relating to the 19th Arietis. Then by the index I am referred, in the column allotted for that star, to 77 observations; and find that FLAMSTEED used the letter  $\alpha$  72 times, and that in two places he calls it a star of the 2d magnitude; the rest of the observations being without any estimation of its brightness.

If it be required to know FLAMSTEED's observations upon the 34th Tauri, which star is supposed to have been the Georgian planet, mistaken by FLAMSTEED for a small fixed star; \* we find in our index, that on page 86, December 13, 1690, a star of the 6th magnitude was observed, which answers to the

\* See *Astronomisches Jahr-Buch* for 1789, page 202.

place of the 34th Tauri in the British catalogue; and that no other observation of the same star occurs in the second volume. In my catalogue of comparative brightness, the 34th Tauri is put down among the lost stars, it being no longer to be seen in the place where it was observed by FLAMSTEED.

If in my review of the heavens I cannot find 38 Leonis, and examine this index, I am at once informed that FLAMSTEED never observed such a star; and that of consequence it has been inserted in the British catalogue by some mistake or other. In many cases, these mistakes may be easily traced, as has been shewn with regard to this star in my second catalogue of comparative brightness. See the note to 38 Leonis.

When we wish to examine 90 Ceti in the heavens, and cannot find it, we are informed by our index, that 90 Ceti is the same star with 1 Eridani; and that, consequently, we are not to look out for two different stars.

We may now proceed to give some general results that are to be obtained from an inspection of our index. They are as follows.

111 Stars inserted in the British catalogue have never been observed by FLAMSTEED. This will explain why so many stars in the heavens seem to have been lost.

There are 39 stars in the same catalogue that want considerable corrections in right-ascension or polar-distance. In many it amounts to several degrees.

54 stars more, besides the 39 that are taken from the erroneous stars in the catalogue, want corrections in the *Atlas Cœlestis*; several of them also of many degrees.

42 stars are put down, which must be reduced to 21; each going by two names in different constellations.



371 stars, completely observed both in right-ascension and zenith-distance, have been totally overlooked.

35 more, which have one of the two, either right-ascension or polar-distance doubtful, have been omitted.

86 with only the polar-distance, and 13 with only the right-ascension, have also been unnoticed.

About 50 more that are pointed out by pretty clear descriptions, are likewise neglected; so that upon the whole between five and six hundred stars observed by FLAMSTEED, have been overlooked when the British catalogue was framed.

These additional stars will make a considerable catalogue, which is already drawn up and nearly finished by Miss HERSCHEL, who is in hopes that it may prove a valuable acquisition to astronomers.

Neither the index to FLAMSTEED's observations, nor the catalogue of omitted stars, were finished when my former two catalogues of comparative brightness were given; I shall therefore now select a few notes to be added to those which are at the end of these catalogues. They will contain such additional light as I have been enabled to gather from this newly acquired assistance.

*Additional Notes to the Stars in the First Catalogue of the comparative Brightness of the Stars.*

*Aquarius.*

25 Is the same star with 6 Pegasi. There are but two observations upon it. The first is on page 57; FLAMSTEED calls it "*in constellatione Pegasi sub capite.*" The second, on page

71, is described "*in constellatione Aquarii trianguli in capite* "*præcedens et borealis.*" Here we see that the double insertion in the catalogue is owing to the star's having been called by different names in the observations. See also Mr. WOLLASTON's catalogue, zone 88°.

27 Is the same with 11 Pegasi. There are three observations: the first places the star in the constellation of Pegasus, the two latter in that of Aquarius. See also Mr. WOLLASTON's catalogue for this star, and others of the same kind.

65 Has not been observed by FLAMSTEED; notwithstanding which we find it inserted in my first catalogue, where its relative brightness is given. It should be considered that, in the first place, several stars of which there are no observations in the second volume of FLAMSTEED's works, and which are, nevertheless, inserted in the British catalogue, such for instance as  $\theta$  and  $\iota$  Draconis, are well known to exist in the heavens. Now whether they were put into the catalogue from observations that are not in the second volume, or taken from other catalogues, it so happens that observations of them cannot be found. Therefore the want of a former observation by FLAMSTEED, is not sufficient to prove that a star does not exist. In the next place it should be recollected, that the method used to ascertain the stars in estimating their brightness, is not so accurate, as to point out with great precision the absolute situation of a star; and that, consequently, another star which happens to be not far from the place where the catalogue points out the star we look for, may be taken for it; especially when there are no neighbouring stars of the British catalogue that may induce us to exert uncommon attention in ascertaining the identity of such a star. MAYER, however, has an obser-



vation of 65 Aquarii in his zodiacal catalogue, No. 932, which puts the existence of the star out of doubt.

72 As the star neither was observed by FLAMSTEED, nor does exist, we cannot admit the remark which Mr. WOLLASTON in his catalogue, zone 95°, has upon MAYER's 939 star; where he supposes an error in declination of 3 degrees to have been committed, on a supposition of its being FLAMSTEED's 72.

80 Requies + 2' in time in RA, and therefore is not the star I have given, which requires — 1' 35".

104 Which is without RA in the British catalogue, has three complete observations, page 8, 70, and 331.

*Aquila.*

29 Is without RA. There is but one observation of FLAMSTEED, page 53, which has no time. The RA is given by M. DE LA LANDE, in Mr. BODE's *Jabr-Buch* for 1796, page 163.

33 and 34 Which do not exist, were probably inserted by a mistake of one hour in the time of one of the observations on the two stars 68 and 69. In the zenith-distance, page 71 of FLAMSTEED's observation of 69 Aquilæ, for 53° read 55°.

40 and 43 Which do not exist, were probably also inserted by the same mistake of one hour in the RA of 70 and 71.

*Capricornus.*

1 and 2 Should be ξ' ξ". FLAMSTEED calls them so in his observations, and MAYER has also adopted the same letters in his catalogue, No. 821 and 822.

*Cygnus.*

5 Is without RA in the British catalogue; but the star has not been observed by FLAMSTEED.

9 Is without RA; FLAMSTEED, however, has a complete observation of it, page 67.

24 Has no RA. The time observed by FLAMSTEED is only doubtful in the seconds. Its RA has been given in Mr. BODE's *Jabr-Buch* for 1797, page 163.

33 Has no RA. FLAMSTEED never observed this star; but it is 3 Cephei Hevelii.

38 Has no RA in the British catalogue; but as the defective and only observation of FLAMSTEED on page 75, which might be supposed to belong to 38, will agree better with 43, it follows that he never observed 38.

68 Has no RA. There is a complete observation by FLAMSTEED, page 75.

78 Has no time in FLAMSTEED's observations. It is No. 146 in DE LA CAILLE's catalogue.

79 Has no RA. FLAMSTEED has but one observation, which is without time. Mr. BODE gives it in his *Jabr-Buch* for 1797, page 163.

*Hercules.*

24 Is the same with 51 Serpentis.

28 Is the same with 11 Ophiuchi.

54 There is no observation of this star. The zenith-distance of 55 was taken twice April 8, 1703 (instances of which we find in several other stars), which occasioned its being inserted as two stars.



63 There is no observation of this star, nor does it exist. The star of which the brightness is given in my catalogue, is at some distance from the place assigned in the British catalogue. FLAMSTEED observed a star, page 444, which will be No. 269 in Miss HERSCHEL's manuscript catalogue. This, with an error in the calculation of the PD, probably occasioned the insertion of 63. And if this be the star, the PD of the British catalogue must be corrected  $+ 3^{\circ}$ .

71 Has never been observed by FLAMSTEED, nor does it exist. A small error in the calculation of one of the four observations of 70, may have produced it.

80 and 81 Were never observed. The two stars, 24 and 25 Draconis, miscalled in FLAMSTEED's observations, page 55 and 175, with an error of PD, accounts for the insertion of these stars. See Mr. BODE's *Jabr-Buch* for 1787, page 194.

93 The PD is marked :: (doubtful), in the British catalogue; but the observation of FLAMSTEED, page 520, is complete.

*Pegasus.*

6 Is the same star with 25 Aquarii.

11 Is the same star with 27 Aquarii.

*Additional Notes to the Stars in the Second Catalogue of the comparative Brightness of the Stars.*

*Aries.*

1 There is an observation of a star by FLAMSTEED, which being calculated with an error of 10' of time in RA, would produce 1 Arietis; we may therefore correct the British cata-

logue RA  $+ 10'$ , and the star will be found to exist. In Miss HERSCHEL's manuscript catalogue it is No. 143.

2 Is the same star with 107 Piscium.

38 is the same star with 88 Ceti. In three observations, page 85, 285, and 485, FLAMSTEED has called it Arietis; and on page 481 he has called it Ceti. See also Mr. BODE's *Jabr-Buch* for 1793, page 200.

50 By FLAMSTEED's observation, page 273, the catalogue requires —  $1'$  in time of RA.

#### *Cassiopea.*

3 The place in the catalogue by two observations of FLAMSTEED requires  $+ 5\frac{1}{4}'$  of time in RA, and  $+ 7'$  of PD.

8 Is marked :: but has four complete observations on page 140, 144, 145, and 147.

29 There is an observation of FLAMSTEED on page 144 which has produced this star, but the time of it requires a correction of  $+ 6'$ ; and it will then belong to 32. That this correction should be used, will appear when we compare this observation with another on page 213. In both places a star which is not inserted in the British catalogue, but which is No. 384 of Miss HERSCHEL's manuscript catalogue, was taken at the same time. On page 144 it is "*Duarum infra  $\gamma$ , versus polum, borealis. Simul fere transit, austrea;*" and on page 213 we have "*post transitum*" for the new star, and "*cum priore*" for 32; and in both places the zenith-distance perfectly shews that they were the same stars: the 32d and a star south of it. And they are now both in the places where FLAMSTEED has observed them.



30 FLAMSTEED has no observation of this star. It is  $\mu$  21 Cassiopeæ Hevelii.

33 FLAMSTEED observed no RA of this star. It is  $\theta$  23 Cassiopeæ Hevelii.

34 Is wrong in the catalogue. By two observations of FLAMSTEED, page 144 and 521, it requires a mean correction of  $-9'$  of time in RA. In this case my double star III. 23 will no longer be  $\phi$  34 Cassiopeæ, but a star  $9'$  of time preceding  $\phi$ ; for it exists in the place where 34 is put in Atlas, according to the erroneous catalogue, and is rather larger than FLAMSTEED's star  $\phi$ .

35 The RA is marked :: The single observation, page 207, has the time marked *circiter*, being probably set down to the nearest minute only; and by the same observation the PD requires  $+20'$ .

47 Is also marked :: but has one complete observation, page 149.

51 The observation of FLAMSTEED which produced this star should be corrected  $+1$  hour. This makes it 37 Cassiopeæ Hevelii.

52 and 53 By FLAMSTEED's observation page 208, should be the reverse in PD of what they are.

*Cetus.*

14 If we correct the British catalogue  $\mp 3'$  in PD, it will become a star observed by FLAMSTEED, which is No. 312 in Miss HERSCHEL's manuscript catalogue.

26 FLAMSTEED has no observation of this star; but we find it in DE LA CAILLE's zodiacal catalogue, No. 10.

51 Is the same with 106 Piscium. FLAMSTEED has 23 ob-

for + read -

servations of the star, and has always called it  $\gamma$ , except once on page 482, where it is without letter, and where the constellation is marked Aquarii; now, as there was immediately following an observation of 54 Ceti, and Aquarius was evidently wrong, the star has been put in Cetus.

58 By FLAMSTEED's observation, page 358, the RA in the British catalogue requires a correction of  $-9'$  in time.

74 FLAMSTEED has no observation of this star, nor can I find it in any other catalogue. The place of it is so distant from other stars of the British catalogue, that my estimation of brightness may belong to some star not far from the situation assigned, and that the star of the British catalogue may not exist.

88 Is the same with 38 Arietis. See Mr. BODE's *Jahr-Buch* for 1793, page 200.

#### *Eridanus.*

44 In the British catalogue is marked  $::$ . The single observation of FLAMSTEED, page 153, is perfect, all but a difference of  $5'$  between the zenith-distance by the diagonal lines and by the screw.

45 Marked  $::$  has a complete observation, page 153.

68 Marked  $::$  has a complete observation, page 146.

#### *Gemini.*

50 There is no observation on this star. The star I have given is at a considerable distance from the place assigned by the British catalogue, so that in fact the star of the catalogue does not exist. It has been inserted in the British catalogue by a mistake in the calculation of a star which is about  $1^{\circ} 49'$  more



*North* - ~~South~~ This will be No. 139 in Miss HERSCHEL's manuscript catalogue, and it is probably the real intended 50 of FLAMSTEED. The expression of its brightness 41.50 of my catalogue will do very well for it.

70 and 71 By FLAMSTEED's observations should be called  $\pi'$ , and  $\pi''$ . TYCHO and HEVELIUS also call 71  $\pi$ .

72 and 73 Have been inserted by a mistake in 64 and 65. See Mr. BODE's *Jabr-Buch* for 1788, page 175.

76 FLAMSTEED has no observation of this star. It is, however, MAYER's No. 310.

80 Is not  $\pi$ , but according to FLAMSTEED's observation *quæ sequitur*  $\pi$ ; and has no letter.

#### *Leo.*

10 Is the same with 1 Sextantis.

25 This star does not exist in the place where the British catalogue gives it; but if we admit that it has been inserted by a mistake in the calculation of 10 Sextantis, it may be taken into the constellation of Leo, as a star inserted in two constellations; and it will then be "25 is the same with 10 Sextantis."

26 In FLAMSTEED's observations, page 299, the *strias cochleæ* give 26' less than the *lineas diagonales*. The former are right; therefore the British catalogue must be corrected PD — 26'.

28 FLAMSTEED has no observation of this star. It was probably inserted by a mistake in calculating an imperfect observation of 11 Sextantis. If this be allowed, we then must say "28 is the same with 11 Sextantis."

66 FLAMSTEED has no observation of this star. There is

a small star near the place where the British catalogue has given it, of which I have expressed the brightness; but as its situation is not exactly where it ought to be, my catalogue should have, "does not exist."

67 Is the same with 53 Leonis minoris.

71 May have been inserted by a mistake in one of the three observations of 73; putting the star north of  $\theta$  instead of south.



## III. Catalogue of the comparative Brightness of the Stars.

Lustre of the stars in Andromeda.			
1	o	3.4	15-1-16
2		6	20-2,4
3		6	8.3
4		6	2,4,6
5		6	11,5
6		6.7	4,6
7		5.6	7-8
8		6	7-8,11 8.3
9		6	10.9
10		6.7	13-10.9
11		6	8,11,5
12		6	15.12,13
13		6	12,13-10
14		6	14.15
15		6	14,15.12
16	λ	4	16-17 1-16
17	ι	4	16-17,19 19,17
18		6	20.18
19	κ	4	17,19-20 19,17
20	ψ	5.6	19-20 20-2 22-20.18 22-20-23
21	α	2	21,43 21,8 Pegasi 21,43 21-43
22		5	22-20
23		6	20-23,26
24	θ	4.5	25,24-27
25	σ	5	25,24
26		6	23,26
27	ρ	5	24-27
28		6	29-28 32.28,40

## Lustre of the stars in Andromeda.

29	$\pi$	4.5	30. 29 - 28	29, 35		
30	$\epsilon$	4	37 - 30. 29			
31	$\delta$	3	4 Trianguli =	31 -, 2 Trianguli		
32		6	35 - 32. 28	32 - 39		
33		Neb.	is a Nebula			
34	$\zeta$	4	35, 34, 38			
35	$\nu$	4	29, 35 - 32	35, 34	35 - 48	50 -, 35, 53
36		6	38 -, 36			
37	$\mu$	4.3	37 - 30	37 - 50		
38	$\eta$	4.5	34, 38 -, 36			
39		6	32 - 39			
40		6	28, 40			
41	$d$	5	42 -, 41. 45			
42	$\phi$	5	54; 42 -, 41			
43	$\beta$	2	21, 43. 57	21, 43; 57	21 - 43, 57	
			43, 13 Ari	43 - 13 Ari	43 -, 57	
44		6	45. 44			
45		5.6	41. 45. 44	45. 47		
46		4.5	48, 46, 49			
47		6	45. 47			
48		5	35 - 48, 46			
49	$\xi$	5	46, 49			
50	$\nu$	6.5	37 - 50 -, 35			
51	$\nu$	5	51 - 1			
52	$\lambda$	6	53, 52. 55			
53	$\tau$	5	35, 53, 52	58, 53 - 56	53, 60	
54	$\phi$	4	54; 42			
55		Neb.	52. 55			
56		6	53 - 56. 59	60, 56		



Lustre of the stars in Andromeda.						
57	$\gamma$	2.3	43.57	57; 13 Arietis	43; 57	43.57
			43.57			
58		6	58.53			
59		6	56.59			
60	$b$	6	53.60, 56			
61		6	63.61	66.61		
62	$c$	6	65.62			
63		6	64.63, 61	6 Persei, 63		
64		6	65-64.63			
65		5	65-64	65.62	65, 6 Persei	
66		6.7	66; 61			
Lustre of the stars in Bootes.						
1		6	7.1	6-1, 2		
2		6	1.2.10			
3		6	11.3			
4	$\tau$	4	5.4-6			
5	$\nu$	4	5.4	30-5, 35		
6		5.6	6.7	4-6-1		
7		7	6.7, 1	7-26		
8	$\eta$	3	8.27	79 Virginis; 8	8-27	36-8
9		5	12.9-11			
10	$e$	7	2.10			
11		7.6	9-11.3			
12	$d$	5	28; 12.9			
13		6	13-24			
14		6	18.14.15			
15		6	14.15			
16	$\alpha$	1	16--3	Lyrae		
17	$\kappa$	4	21.17			

Lustre of the stars in Bootes.				
18		6	20, 18, 14	
19	$\lambda$	4	19, 23	
20		5	20, 18	20; 22
21	,	4	23, 21, 17	
22	f	5	20; 22	
23	$\theta$	4	19, 23, 21	
24	g	0.7	13-24	
25	e	4	25--51	
26		7	7-26	34--26
27	$\gamma$	3	8, 27-49	27-, 49 8-27 27-, 42
28	$\sigma$	5	51-28	28; 12
29	$\pi$	4.3	35, 29	
30	$\zeta$	3	30-, 5	
31		5	35-31-32	
32		6	31-32	
33	b <sup>1</sup>	6	39, 33-38	
34		6	34--26	
35	$\nu$	4.5	5, 35, 29	37, 35-31
36	$\epsilon$	3	5 Coronæ	36-8
37	$\xi$	4	37, 35	
38	b <sup>2</sup>	6	33-38	
39		6	47, 39	39, 33
40		6.7	47-40	
41	$\omega$	5	45; 41-46	41, 48 41, 50
42	$\beta$	3	49, 42	42, 49 27-, 42, 49 42, 49
43	$\psi$	5	43-45	
44		6	44, 47	
45	c	5	43-45; 41	
46	b	6	41-46	48, 46
47	k	5	44, 47, 39	47-40
48	$\chi$	5	41, 48, 46	



## Lustre of the stars in Bootes.

49	$\delta$	3	27 -, 49 42, 49	42 -, 49 27 -- 49	42 . 49	42 , 49
50		5	41 . 50			
51	$\mu$	4	25 -- 51 - 28	4 Coronæ . 51 . 7 Coronæ		
52	$\nu^1$	6	53 : 52 . 54			
53	$\nu^2$	6	53 : 52			
54	$\phi$	6	52 . 54			

## Lustre of the stars in Cancer.

1		6	5 . 1			
2	$\omega^1$	6	9 . 2 . 4	14 . 2 . 4		
3		6	16 -, 3 . 5	8 - 3 . 12		
4	$\omega^2$	6	2 . 4 . 13			
5		6	3 . 5 . 1			
6	$\chi$	5	6 - 14	6 - 15	6 , 18	
7		8	9 . 7			
8		6	8 - 3			
9	$\mu^1$	7	10 - 9 . 2	9 . 7		
10	$\mu^2$	5	10 - 9			
11		6	14 . 11	15 - 11		
12		6	3 . 12			
13	$\psi^1$	6 . 7	4 . 13			
14	$\psi^2$	4	14 . 2	6 - 14 . 11		
15	$\psi^3$	5	6 - 15 - 11			
16	$\zeta$	5 . 6	43 . 16 -, 3			
17	$\beta$	4 . 3	17 , 47	17 . 48		
18	$\chi$	6	6 , 18 . 23			
19	$\lambda$	6	19 - 30 . 28			
20	$d^1$	6	31 . 20 . 25			
21		6	37 . 21 . 34	29 - 21		

Lustre of the stars in Cancer.			
22	$\phi^1$	6.7	23, 22
23	$\phi^2$	6	18, 23, 22
24	$\nu^1$	6	32, 24
25	$d^2$	6	20, 25
26	$\phi^3$	6	Does not exist.
27		6	27; 29
28	$\nu^2$	6.7	30, 28, 32
29		6.7	27; 29-21
30	$\nu^3$	6	19-30, 28
31	$\theta$	6.5	31, 20 31.33
32	$\nu^4$	7.8	28, 32, 24
33	$\eta$	6.7	31.33
34		6	21, 34, 36
35		7	42; 35, 38
36	$c^1$	6	34, 36
37	$c^2$	6	49-37, 21
38	$\epsilon$	8	42; 38, 40 35, 38
39		6	39, 41
40		6	38, 40
41	$\epsilon$	7	39, 41, 42
42	$c$	7.8	41, 42; 38 42; 35
43	$\gamma$	4	43, 16 47-, 43
44		6	20---44 4--44
45	$A^1$	6	76, 45, 60
46		6	55; 46, 61
47	$\delta$	4	17, 47-, 43 65, 47--76 48, 47
48	$\epsilon$	5	17, 48, 47 48--58
49	$b$	6	49-37
50	$A^2$	6	60, 50
51	$\sigma^1$	6	51, 64
52		6	54-52



## Lustre of the stars in Cancer.

53	$\epsilon^1$	6	55; 53
54		7	62-, 54-52 82, 54, 81
55	$\epsilon^1$	6	58-55; 53 67.55, 70 57-55; 46
56	$\epsilon^3$	6	Does not exist.
57	$\epsilon^2$	5.6	58; 57-55 57, 72
58	$\epsilon^3$	6	48--58-55 58, 75 58; 57
59	$\sigma^2$	5.6	64.59.66
60	$\alpha^1$	4.5	45.60, 50
61		6	46.61
62	$\sigma^1$	6	63.62-, 54
63	$\sigma^2$	6	63.62
64	$\sigma^3$	6	51.64.59
65	$\alpha^2$	4	65.47
66	$\sigma^4$	6	59.66
67	$\epsilon^4$	6.7	67.55
68		6	81-68, 71 68.78 68; 80
69	$\nu$	6	69; 77
70	$\epsilon^5$	6.7	55, 70
71		7	68, 71 78, 71
72	$\tau$	6.7	57, 72
73		6	Does not exist.
74		6	Does not exist.
75		6.7	58, 75
76	$\kappa$	4.5	47--76, 45
77	$\xi$	5.6	69; 77-, 79
78		6	68.78, 71 83, 78 80, 78, 71
79		8	77-, 79
80		7	80-83 68; 80, 78
81	$\pi$	7	54, 81 81-68 81, 83
82		6	82, 54
83		6	81, 83 80-83, 78

Lustre of the stars in Centaurus.			
1	<i>i</i>	4.5	3.1.5
2	<i>g</i>	4.5	5-2
3	<i>k</i>	4.5	4.3.1
4	<i>b</i>	4.5	4.3
5	<i>θ</i>	2.3	1.5-2
Lustre of the stars in Cepheus.			
1	<i>κ</i>	5	1.17
2	<i>θ</i>	5	3-, 2
3	<i>η</i>	4	32, 3-, 2    21 $\frac{1}{2}$ 3    32 $\frac{1}{2}$ 3
4		6	6-4.7
5	<i>α</i>	3	5-, 37 Cygni    5.37 Cassiopeæ
6		6	6-4
7		6	4.7
8	<i>β</i>	3	35-, 8-, 32
9		6	17-9-12    11, 9
10		5	10.17
11		5	11.9
12		7	9-12
13	<i>μ</i>	6	13, 14
14		6	13.14-, 15
15	<i>ν</i>	7.6	14-, 15-15
16		5.6	24, 16, 78 Draconis
17	<i>ξ</i>	5	1.17, 33    10.17-9    23, 17--30
18			19, 18; 20
19		6	22.19, 18
20		6	18; 20
21	<i>ζ</i>	4.5	21 $\frac{1}{2}$ 3
22	<i>λ</i>	6	22.19
23	<i>ι</i>	4	23, 17
24		5.6	24, 16



Lustre of the stars in Cepheus.			
25		7	26-, 25
26		6	30-, 26-, 25
27	$\delta$	4.5	32, 27 27.23 21-27-23 21 = 27
28		6	28-29
29	$\epsilon$	6	28-29
30		6	17--30-, 26
31		6	34-31
32	$\iota$	4	8-, 32.3 32; 3
33	$\pi$	5	17.33
34	$\circ$	5	34-31
35	$\gamma$	3	35-, 8
Lustre of the stars in Corona Borealis.			
1	$\circ$	6	2--1
2	$\eta$	5	2--1
3	$\beta$	4	8; 3-13
4	$\theta$	4.5	13; 4-10 4.7
5	$\alpha$	2.3	55 Ophiuchi, 5 5-36 Bootis
6	$\mu$	5	11-6, 9
7	$\zeta$	4	4, 7, 10
8	$\gamma$	4	8; 3
9	$\pi$	5	6, 9 12, 9
10	$\delta$	4	4-10 7, 10
11	$\kappa$	5	11-6
12	$\lambda$	5	12, 9
13	$\epsilon$	4.5	3-13; 4
14	$\iota$	5.6	14, 19
15	$\epsilon$	6	17, 15
16	$\tau$	6	16-17
17	$\sigma$	6	16-17 17, 15
18	$\upsilon$	6	19-, 18

Lustre of the stars in Corona Borealis.				
19	ζ	5	14, 19-, 18	
20	ν	5	20 = 21	
21	ν	5	20 = 21	
Lustre of the stars in Lacerta.				
1		5	7, 1, 8	1, 1 Hevelii . 6
2		5	7-2, 5	
3		4.5	4.3, 9	
4		5	5.4.3	
5		4.5	7-5	2, 5.4
6		5	7-6, 11	1 Hevelii . 6
7		4	7-5	7-2 7-6 7, 1
8		6	1, 8, 10	
9		6	3, 9	
10		6	8, 10, 12	
11		5	6, 11, 15	
12		6	10, 12	
13		6	15, 13, 14	
14		6	13, 14, 16	
15		5	11, 15, 13	
16		6	14, 16	
Lustre of the stars in Lepus.				
1		9	7-1	10, 1, 12
2	ι	4	5, 2, 13	
3	ι	5	3, 6	
4	κ	5	6, 4, 7	4, 8
5	μ	4	9, 5, 2	5, 14
6	λ	4.5	3, 6, 4	
7	ν	5.6	4, 7	8, 7-1
8		6	4, 8, 7	



Lustre of the stars in Lepus.			
9	$\beta$	3	11-9, 5
10		6	10, 1
11	$\alpha$	3	11-9
12		6	1, 12
13	$\gamma$	3, 4	2, 13, 15
14	$\zeta$	4	5, 14, 16
15	$\delta$	4, 3	13, 15
16	$\eta$	4	14, 16-18
17		6	18, 17-, 19
18	$\theta$	4	16-18, 17
19		6	17-, 19
Lustre of the stars in Navis.			
1		6	686 De la Caille - 1 - 19
2		6	5, 2, 10
3	$\tau$	4, 5	3, 11
4		6	4, 9 4, 6
5		6	9, 5, 2
6		5	4, 6, 9
7	$\xi$	3, 4	15--7=5, 11
8		5, 6	10, 8
9		4	4, 9, 5 6, 9
10		6	2, 10, 8
11	$\epsilon$	4	7 = 5, 11 - 12 11, 16 11 -, 12 3, 11, 665 De la Caille.
12		6	11-12 11-, 12-1
13		4	13, 13 Canis min. 13-13 Canis min.
14		6	16-14 16-, 14
15		3	15, 31 Canis maj. 15--7
16		5	11, 16-14 16-, 14
17		6	20-17-, 18

Lustre of the stars in Navis.				
18		6	20, 18-, 22	
19		4.5	19, 20	
20		5.6	19, 20-21 19, 20, 18 20-, 21 20-17	
21		6	20-21 20-, 21	
22		6	18-, 22	
Lustre of the stars in Orion.				
1		4	1-, 3 1-8	
2	$\pi^1$	4	3--2-7	
3		4	1-, 3 8, 3--2 3, 9	
4	$\sigma^1$	4.5	9-4 11, 4, 15 4--96 Tauri 4, 97 Tauri.	
5		6	10-, 5	
6	$g^1$	6	7-6, 14	
7	$\pi^2$	6	2-7-6	
8	$z$	4	1-8, 3 8-, 10	
9	$\sigma^2$	4.5	3-9-4	
10		4.5	8-, 10-, 5	
11	$\gamma^1$	5	11, 4	
12		6	Does not exist.	
13		6	16-13 18-13	
14	$i$	5	6, 14; 16	
15	$\gamma^2$	5	4, 15-35	
16	$b$	6	14; 16-13 16, 18	
17	$\epsilon^1$	4.5	25, 17-21	
18		6.5	16, 18-13	
19	$\beta$	1	19, 10 Canis min. 19 = 5, 87 Tauri 19-, 10 Canis min.	
20	$\tau$	4	20, 29 28-20 = 29	
21		6	17-21	
22		5	22, 27 22, 31 22-11 Monocerotis	



Lustre of the stars in Orion.			
23	<i>m</i>	6	30, 23, 38
24	$\gamma$	2	112 Tauri -, 24-46 24-, 46
25	$\psi^1$	5	25, 17 47, 25, 30
26		6	Does not exist.
27	$\epsilon^2$	6	22, 27 31, 27
28	$\eta$	3	44-28, 48 28-20
29	<i>e</i>	5	20, 29, 36 20 = 29:53
30	$\psi^2$	5	25, 30, 23
31		6	22, 31, 27
32	<i>A</i>	5	32, 47
33	<i>n</i>	6	38, 33
34	$\delta$	2	50-34:53 50-, 34 53:34
35		6	15-35
36	<i>v</i>	4	29, 36-49
37	$\phi^1$	5	40-37 61, 37
38		6	23, 38, 33
39	$\lambda$	4	39-40
40	$\phi^2$	5	39-40-37 40, 61
41	$\theta^1$	6	41, 43
42	$c^1$	5	42, 45
43	$\theta^2$	4	41, 43
44	<i>i</i>	3, 4	44-28
45	$c^2$	5	42, 45
46	<i>e</i>	2	46, 50-34 24-46 46-30 Hydræ 46-50 24-, 46
47	$\omega$	5	32, 47, 25
48	$\sigma$	4	28, 48
49	<i>d</i>	5	36-49 49-55
50	$\zeta$	2	50, 24 Gemin 46, 50-34 46-50-, 34 50-24 Gemin
51	<i>b</i>	5	50:51:52

Lustre of the stars in Orion.			
52		6	51; 52, 60
53	$\alpha$	3	35; 53 29; 53 30 Hyd - 53 53; 34
54	$\chi$	5	54--57 54-62
55		6	49-55
56		6	56; 51
57	$\chi$	5	54--57 68, 57
58	$\alpha$	1	58. 10 Canis min. 58--87 Tauri 58-, 10 Canis min.
59		6	60-, 59
60		6	52, 60-, 59
61	$\mu$	4	40, 61, 37
62	$\chi$	6	54-62-64
63		6	66. 63 66; 63
64	$\chi$	6	62-64
65	$\chi$	5.6	Does not exist.
66		6	66. 63 66; 63
67	$\nu$	4.5	67; 70 67, 70
68		6	71, 68, 57
69	$f$	6	70-69. 72
70	$\xi$	4.5	67; 70-, 74 70-75 67, 70-69
71		6	71, 68
72	$f$	6	69. 72
73	$k$	6	74; 73
74	$k$	6	70-, 74; 73 75, 74
75	$l$	6	70-75, 74
76		6	Does not exist.
77		6	77-78
78		6	77-78



Notes to Andromeda.

1 By three observations of FLAMSTEED, page 130, 138, and 140, the polar-distance in the edition of 1725 requires  $+9^{\circ}$ .

40 Is the same with 69 Piscium. FLAMSTEED observed it five times; twice among the stars of the constellation Pisces, and three times among those of Andromeda. See page 14, 134, 139, 149, and 210.

61 M. DE LA LANDE says is lost. See Mr. BODE's *Jabr-Buch* for 1794, page 97; but as the star is now in its place, it may perhaps be changeable, and ought to be looked after.

Notes to Bootes.

47 The RA in the British catalogue is only given to the nearest degree, and Mr. BODE and Mr. WOLLASTON, in their catalogues, have left it out; but FLAMSTEED has four complete observations of it, on page 166, 168, 414, and 415, and the star is called *k* in all of them.

Notes to Cancer.

26 Was not observed by FLAMSTEED. An observation on page 297 has occasioned the insertion of this star; but by correcting the time — 1', it will agree with two other observations of 22 Cancr on page 21 and 26. See Mr. BODE's *Jabr-Buch* for 1788, page 172.

56 This star has not been observed by FLAMSTEED, nor does it exist. Page 25 FLAMSTEED observed 55 Cancri with a memorandum, "*Hec habet comitem sequentem ad austrum;*" which has probably occasioned the insertion of this star; but he had not then observed all the  $\epsilon$ 's, and might possibly mean

to point out  $\epsilon$  53; which he afterwards observed on page 27. The stars are so near together that he might easily mistake *sequens* for *præcedens ad austrum*. FLAMSTEED in his observations calls 58 3d  $\epsilon$ , 67 4th  $\epsilon$ , and 70 5th  $\epsilon$ ; this shews that there is no authority for six  $\epsilon$ 's. See Mr. BODE's account of the same star in his *Jahr-Buch* for 1788, page 171.

71 "April 5, 1796. 71 Cancrī is 15' nearer to 78 and 15' farther from 68 than it is placed in Atlas."

73 and 74 Have not been observed by FLAMSTEED, nor do they exist. How they came to be inserted, does not appear to be satisfactorily accounted for by Mr. BODE in his *Jahr-Buch* for 1788, page 172. He gives us four observations of 62 and 63 Cancrī; but FLAMSTEED has thirteen, and they are all perfect except the last on page 564.

*Notes to Cepheus.*

15 "October 25, 1796. 15 Cephei consists of two stars. "Both taken together for one, by the naked eye, give 14 : 15 "In the telescope they are 14 - 15 - 15."

18 Has no time in FLAMSTEED's observations. "March 26, "1797. 18 is a very little preceding 19. It is  $1\frac{1}{2}$  degree from "17. The stars 18, 20 and 19 are in a line which bends a "little at 18 towards the preceding side."

*Notes to Corona Borealis.*

21 In the British catalogue requires a correction of  $-28'$  21" in time of RA and  $-14'$  55" in PD. In the place where it is marked in Atlas, according to the erroneous catalogue, is no star; but very unaccountably it is also marked in its right place in the same Atlas. FLAMSTEED has four complete obser-



vations of it on page 167, 445, 477, and 478. Mr. WOLLASTON not being acquainted with the existence of  $\alpha 1$  Coronæ in its right place, supposes zone  $55^\circ$ , that I have made a mistake in calling my double star VI. 18, very unequal; but in his corrections he gives us the place of a star, as he calls it "near  $\nu$ ," which is the real second  $\nu$  of FLAMSTEED; who very particularly describes it on page 167, "*Duarum ad  $\nu$  sequens et clarior;*" and this is the double star I have given in my catalogue as  $\alpha 1$  Coronæ.

#### Notes to Navis.

1 There is no observation of this star; but in Miss HERSCHEL's manuscript catalogue, No. 92, is a star  $2^\circ$  more south, which has probably been calculated wrong, and has given occasion for its insertion; correcting, therefore, the PD of 1 Navis  $+ 2^\circ$ , the expression of its brightness is as I have given it.

17 There is no observation of this star; but if we correct the PD  $+ 3^\circ$ , it will then agree with No. 238 in Miss HERSCHEL's manuscript catalogue.

21 By FLAMSTEED's observation page 431, the PD of the British catalogue requires  $+ 18'$ .

#### Notes to Orion.

12 FLAMSTEED never observed this star. It does not appear how it came to be inserted in the British catalogue.

26 FLAMSTEED never observed this star. An error of  $20'$  in PD in the calculation of one of the four observations of  $\alpha 5$  Orionis, may have occasioned the insertion of it.

35 Is marked :: in the British catalogue; but FLAMSTEED

has seven complete observations of this star; therefore the marks :: should be out.

63 There is no observation of this star; but supposing an error of  $+ 2' 14''$  of time in RA, and of  $+ 0' 22''$  in PD, it will then agree with No. 33 of Miss HERSCHEL's manuscript catalogue. I have taken the comparative brightness of that star, supposing it to be 63.

64 and 65 Have no observation by FLAMSTEED; but their insertion has been accounted for by Mr. BODE in his *Fabr-Buch* for 1793, page 195. He mentions FLAMSTEED's two observations on page 17 and 94. There is a third on page 292, which confirms what Mr. BODE says. The 64 of which I give the brightness, is not far from the place assigned to it in the British catalogue. It is No. 1 in Miss HERSCHEL's manuscript catalogue.

76 There is no observation of this star. A mistake of  $41'$  in PD in calculating one of the four observations of 8 Monocerotis, might occasion its insertion.

WM. HERSCHEL.

Slough, near Windsor,  
April 12, 1797.